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ABSTRACT

The relationship between research productivity and teaching effectiveness was studied in 1979 and 1980 by considering faculty members at different career stages and in different academic fields. Two samples of faculty members were evaluated: 2,973 from 61 four-year institutions and 1,623 at 10 four-year colleges and universities that emphasized research productivity. Faculty administered the Student Instructional Report, which includes student ratings of teachers with regard to: course organization and planning, faculty/student interaction, communication, course difficulty and workload, textbooks and readings, tests and exams, the value of the course to the students, and the overall effectiveness of the teacher. These factors were correlated with the self-reported number of publications for each faculty member during the most recent five-year period. For both samples, teachers of social science courses were the only group for which there were consistent though modest relationships between the number of published articles and student ratings of instructor effectiveness. Findings did not support a "spill-over" effect of research on teaching, or a general ability and energy factor. It is concluded that the relationship between performance in teaching and research is either nonexistent or, where it appears, too modest to indicate that one necessarily enhances the other. (Author/SW)

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RESEARCH REPORT

RESEARCH PRODUCTIVITY AND TEACHING EFFECTIVENESS

John A. Centra

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Research Productivity and Teaching Effectiveness

Abstract

This study investigated the relationship between research productivity and teaching effectiveness to shed light on the long-debated question of whether performance in one area enhances performance in the other. The academic field and the stage of a faculty member's career were both considered in the analyses. Two samples of 2,973 and 1,623 faculty members from a variety of institutions were studied. In considering results of both analyses, teachers of social science courses were the only group for which there were consistent though modest relationships between the number of published articles and student ratings of instructor effectiveness. Thus "spill-over" effects, or a "general ability" factor, or other reasons for a possible link between research and teaching performance are not totally supported. The relationship between performance in the two areas is either nonexistant or, where it appears, too modest to conclude that one necessarily enhances the other.

Research Productivity and Teaching Effectiveness

John A. Centra

Although teaching, research, and service are the major functions of most universities, a faculty member's performance as a researcher or teacher generally receives the most attention in determining rewards and promotions (Astin & Lee, 1967; Centra, 1977). Whether these two functions are independent and conflicting for individual faculty members or whether performance in one enhances the other are long-debated questions. Most faculty members think that research benefits teaching, especially at the graduate level. In a survey of natural science faculty members and department heads at one university, for example, 95 percent agreed that "research increases teaching effectiveness by increasing awareness and currency" (Jauch, 1976). Nevertheless, a majority of these same faculty members also said that a good teacher did not have to do research.

Past Research

Past studies support both positions. Most of the results, however, indicate that teaching and research are independent functions, with performance in one unrelated to the other. Most of the studies have compared teaching effectiveness, as measured by student ratings, with research productivity defined in various ways. Linsky and Straus (1975) used both a publications total score based on a weighted summary of the number of articles and books published and a citation score; the faculty members studied were at 16 universities that emphasize research. Student global ratings of teachers did not correlate with either measure of research performance, but student ratings of the instructors' knowledge did correlate modestly (.27) with the total publications score. Dent and Lewis

(1976), studying 90 faculty members in the social sciences at one university, found no correlation between student ratings of teachers and the number of citations given in the Social Science Citations Index. Other insignificant correlations with ratings of teacher effectiveness were found by Voeks (1962), who used faculty membership in a university research society, and by Hoyt (1974), Hayes (1971), and Aleamoni and Yimer (1973), all of whom used some kind of weighted summary of the number of books and articles produced to estimate research productivity. Aleamoni and Yimer also found no correlation between research output and peer nominations of good teachers.

Several studies, however, found a modest relationship between research productivity and student ratings of teacher effectiveness. Stallings and Singhal (1970) reported correlations of .27 and .13 for faculty members at two Big Ten universities. Frey's (1978) sample of 42 Northwestern University senior faculty in the natural sciences produced a correlation of .37 between the number of citations and a teaching skill factor. Hoyt and Spangler (1976) also found that research involvement as judged by department heads was modestly related to student ratings of teaching in natural science courses, but not in social science courses. Finally, Bresler (1968) found that student ratings of teachers were higher for Tufts University faculty members receiving research grants.

Further substantiation of these modest correlations would indicate that many good teachers are also good researchers. Several reasons might explain such a hypothesis. Teaching effectiveness and research productivity are both likely affected by the general ability and energy levels that individual faculty members possess. Those who teach well also tend to have the ability and energy to be above-average researchers or scholars. In fact, they probably would do well in

any number of roles. A second reason is what Linsky and Straus (1975) termed a "spill-over" effect. Research could influence teaching when the excitement and involvement of research is communicated to students and they are able to see knowledge as a constantly growing thing. Participation in research could also help maintain the faculty member's interest in the subject matter. Furthermore, teaching might spill over into research when stimulating discussions with students lead to productive avenues of research.

Failure of the majority of past studies to reveal a relationship between teaching and research may reflect inadequate design rather than independence of the two roles. Academic fields, for example, differ in both research patterns and student ratings of teacher effectiveness (Bayer & Dutton, 1977; ETS College and University Programs, 1979). By including faculty members from a variety of fields in a single analysis, many of the past researchers may have minimized significant relationships. Two studies that investigated faculty members within academic fields (Frey, 1978; Hoyt & Spangler, 1976) found significant correlations for teachers of natural science courses.

Another factor not fully accounted for in past studies is the stage of a faculty member's career. Older faculty members who publish may be more effective teachers because of the "spill-over" effect discussed earlier, while younger teachers may concentrate on research at the expense of teaching in an effort to improve their chances of winning tenure. At many types of institutions, faculty typically perceive publications to be the most influential evidence in decisions on tenure and advancement (Thorne, Scott, & Beaird, 1976).

Purpose

The present study sought to investigate the teaching-research relationship further by considering faculty members at different career stages and in

different academic fields. The expectation was that teaching and research more likely would be significantly related for faculty members in their middle or later years. According to two past studies with limited samples, teaching and research performance should also be related more highly for natural science teachers than for others.

Procedure

Two samples of faculty members were studied in order to test the hypotheses. The first sample was analyzed in 1979; the second sample, which included data collected after that time, was analyzed to determine whether the initial findings could be replicated. The first sample consisted of 2,973 faculty members from 61 four-year institutions. Included were liberal arts colleges, state colleges, and a few doctoral-granting universities; most of these institutions did not put a heavy emphasis on research. Faculty members at these institutions had administered the Student Instructional Report (SIR) in one of their courses from 1976 through 1978. The SIR summarizes ratings of teachers by students on six factors: Course Organization and Planning, Faculty/Student Interaction, Communication, Course Difficulty and Workload, Textbooks and Readings, and Tests and Exams. These six factors and two of the global rating items on the SIR, the value of the course to the students and the overall effectiveness of the teacher, were correlated with the self-reported number of publications for each faculty member during the most recent five-year period. Six categories of responses were provided on the SIR Instructor's Cover Sheet for the number of articles published in the past five years: none, 1-2, 3-5, 6-10, 11-15, and over 15.

Self-reported number of publications generally accurately reflects the actual number of articles published. In one sample of psychologists studied by

Clark and Centra (in press), the self-reported number of articles correlated .84 with entries in Psychological Abstracts (for a sample of four-year college teachers the correlation was even higher at .97). The number of articles produced is also related generally to the quality of research and scholarship, as judged by the number of citations of published work. Cole and Cole (1967), Meltzer (1956), and Schrader (1978) reported correlations in the .60 to .72 range between citations counts and number of publications.

In addition to number of publications, teachers reported their number of years of teaching experience and the subject field of their course on the Instructor's Cover Sheet. The analyses focused on broad subject fields--humanities, natural sciences, and social sciences--and the years of teaching experience which ranged in five categories from 2 years or less to more than 20. The subject field teachers were put into was determined by the course they taught, which in all but rare instances should adequately reflect their own research field.

The Second Sample

The second sample consisted of 1,623 faculty members at 10 four-year colleges and universities who had administered the SIR in their courses in 1979 or 1980. Although research universities were also absent from this sample, an effort was made to include institutions with more emphasis on research productivity than that held by the previous broad-based sample. Thus, only the more selective liberal arts colleges were included, along with doctoral-granting universities and a large state college. The arts and science faculty members in this second sample averaged more publications during the five-year period than the previous sample (2.5 vs. 1.7). As a group, then, they were more productive writers and researchers. Besides again classifying faculty members into the social sciences, natural sciences, or humanities, teachers of "professional subjects" were added

to the second sample. These included mostly teachers of engineering, business, education, and the health professions. Because of the small number of instructors in sample two, the categories of teaching experience were reduced to three: fewer than 6 years, 7-12 years, and more than 13 years. Even so, the numbers in the various subsamples analyzed were considerably smaller than in the first sample. For sample two, only the global student ratings of instructor effectiveness and course value were analyzed because the factor scores did not give any additional information in the first analysis; moreover, the global ratings were considered the most appropriate for the purposes of the study.

Results and Discussion

The correlations between the number of professional articles published during the preceding five years and student ratings of instruction are given in Table 1 for the first sample. A pattern of significant correlations can be noted for social science teachers with seven or more years of experience. Ratings of instructor effectiveness, course value, and Faculty/Student Interaction correlated in the .15 to .29 range with the number of published articles. Ratings of Course Organization and Planning and Communication also correlated with the publications count. The highest correlations were generally among social science teachers with over 20 years of experience (for example, .29 for instructor effectiveness and number of publications). Other significant but modest correlations (.15 or .16) are evident for humanities teachers with 3 to 20 years of experience, especially for instructor effectiveness. For natural science teachers, the correlations were generally insignificant or negative.

In the second sample, significant but modest correlations for social science teachers at all three levels of experience can be noted in Table 2.

Table 1

Sample 1

Correlations Between Number of Publications and Student Ratings of Instruction, by Years of Experience

	Two Years or Less	3-6 Years	7-12 Years	13-20 Years	Over 20 Years
			Humanities		
	N=157	N=280	N=327	N=288	N=204
Instructor Effectiveness	.09	.16**	.15**	.15**	.06
Course Value	.12	.07	.02	.16**	.02
Faculty/Student Interaction	.11	.10	.11*	.03	.03
Course Organization & Planning	.02	.16**	.07	.09	.02
Communication	.11	.10	-.01	.04	-.02
Textbooks & Reading	.13	.13*	.02	.04	.00
Course Difficulty & Workload	-.09	-.13*	-.19**	-.23**	-.15*
Tests and Exams	.13	.03	-.10	.09	.06
			Natural Sciences		
	N=93	N=126	N=136	N=111	N=43
Instructor Effectiveness	.14	-.15	-.06	.05	-.33**
Course Value	.18	-.09	-.06	-.03	-.19
Faculty/Student Interaction	.21*	-.20*	-.04	-.01	-.40**
Course Organization & Planning	.20*	-.17*	-.11	.00	-.49**
Communication	.09	-.13	-.16*	-.13	-.13
Textbooks & Reading	-.10	-.22**	-.06	.08	-.24
Course Difficulty & Workload	-.04	.14	-.24**	.07	.15
Tests and Exams	.24**	-.02	-.12	-.18*	-.06
			Social Sciences		
	N=188	N=349	N=340	N=172	N=154
Instructor Effectiveness	-.08	.09	.16**	.21**	.29**
Course Value	-.07	.07	.17**	.15*	.28**
Faculty/Student Interaction	-.09	.03	.17**	.22**	.16*
Course Organization & Planning	-.16*	.08	.16**	.01	.23**
Communication	-.10	.04	.11*	.09	.24**
Textbooks & Reading	-.16*	.03	-.02	.04	-.06
Course Difficulty & Workload	-.01	-.12*	-.06	-.21**	-.23**
Tests and Exams	-.02	.12*	.11*	.15*	.11

*p < .05
**p < .01

Table 2

Sample 2

Correlations Between Number of Publications and Student Ratings of Instructor Effectiveness and Course Value, by Years of Experience

	Teaching Experience		
	6 Years or Less	7-12 Years	13 Years or More
	Humanities		
	N=104	N=48	N=91
Instructor Effectiveness	.09	.09	-.09
Course Value	.14	.09	-.04
	Natural Science		
	N=107	N=94	N=122
Instructor Effectiveness	-.19*	-.03	.04
Course Value	-.28**	.03	.09
	Social Science		
	N=96	N=83	N=65
Instructor Effectiveness	.23**	.24**	.23*
Course Value	.25**	.19*	.22*
	Professional Areas		
	N=354	N=179	N=280
Instructor Effectiveness	.01	.17*	.13
Course Value	-.01	.07	.07

*p < .05
**p < .01

For these social science teachers, student ratings of instructor effectiveness and course value correlated between .19 and .25 with number of publications. None of the correlations was significant for humanities teachers and only one of the six correlations was significant at the .05 level for teachers in the professional areas. Two of the six correlations for natural science teachers were negative and significant--those for teachers with less than six years of experience.

In considering results of both analyses, teachers of social science courses were the only group for which there were consistent significant relationships between the number of published articles and student ratings of instructor effectiveness or course values. But even these were modest. For teachers of humanities or professional courses, such as those offered in business or education departments, the correlations were insignificant in all but a few instances. For natural science teachers, the correlations were either insignificant or negative. The "spill-over" effect of research on teaching, or a general ability and energy factor, could in part account for the correlations for social science teachers. But why in those disciplines and not others? Two earlier studies (Frey, 1978; Hoyt & Spangler, 1976) reported positive correlations for samples of natural science teachers, results not confirmed with either of the samples of this study. The two earlier studies used a citations count or judgments of research involvement by department heads rather than, as in this study, a publications count during the past five years. Perhaps this difference in the criteria accounts for the difference since a recent estimate of research productivity, such as a current publications count, not only would be a better estimate of research activity but would more likely reflect current "spill-over" effects if they exist. One other study of 86 faculty members in the natural sciences by Jauch (1976) indicated that time spent on research was positively related to various measures of research

productivity but negatively related to teaching (-.43). This would lead one to expect the low or negative correlations found for natural science teachers in the two samples of this study.

The expectation that teaching quality and research productivity would more likely be correlated for teachers in their middle or later years, when teachers no longer need to focus solely on research to better their chances of gaining tenure, was generally not supported in this study, with the exception of the social science teachers in sample one. For that group, correlations were significant only for teachers in their middle or late career stages. In the second sample, however, many teachers in their early years as well as the more experienced groups received high teaching ratings and also tended to publish somewhat more. The career stage of teachers, therefore, does not appear to be an important factor in the teaching-research relationship.

Subject field differences, on the other hand, were critical in this study as well as in others. Baird (1980), for example, studied the relationships between ratings of graduate departments and faculty publication rates and found that the quality of teaching (as judged by graduate students in the departments) was more highly correlated with recent journal publications for psychology departments (.27) than for history or chemistry departments (.14 and -.03, respectively). His findings correspond to the differences found between the social sciences and the other subject fields in this study.

The belief that teaching and research performance are related is undoubtedly stronger than this or any other study has shown. When peers were asked to judge their colleagues' professional performance, their ratings of teaching and research effectiveness correlated with each other (Wood, 1978). Similarly, Hayes (1971) found that department heads' ratings of faculty members as teachers

and researchers were highly correlated. In neither of those studies, however, was the number of publications related to judgments of teaching effectiveness. Student ratings of teaching, as the present study and others have demonstrated, are also unrelated or only modestly related to research productivity. Thus, "spill-over" effects, or a "general ability" factor, or other reasons given for a possible link between research and teaching performance are not supported. The relationship between performance in the two areas is either nonexistent or, where it appears, too modest to conclude that one necessarily enhances the other.

No one would question the need for teachers to keep up with current knowledge in their fields. But whether they must actually carry on research in order to do so is questionable. Reading and discussing current findings in their discipline as a whole may do as much to help some teachers keep up-to-date as if they focused on a narrow research problem. Those that carry on active research programs, on the other hand, are not necessarily less effective teachers as is claimed at times. The lack of consistent negative correlations between research productivity and teacher ratings in this and other studies indicates that performance as a scholar or researcher does not significantly detract from performance as a teacher.

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